Easy in Community

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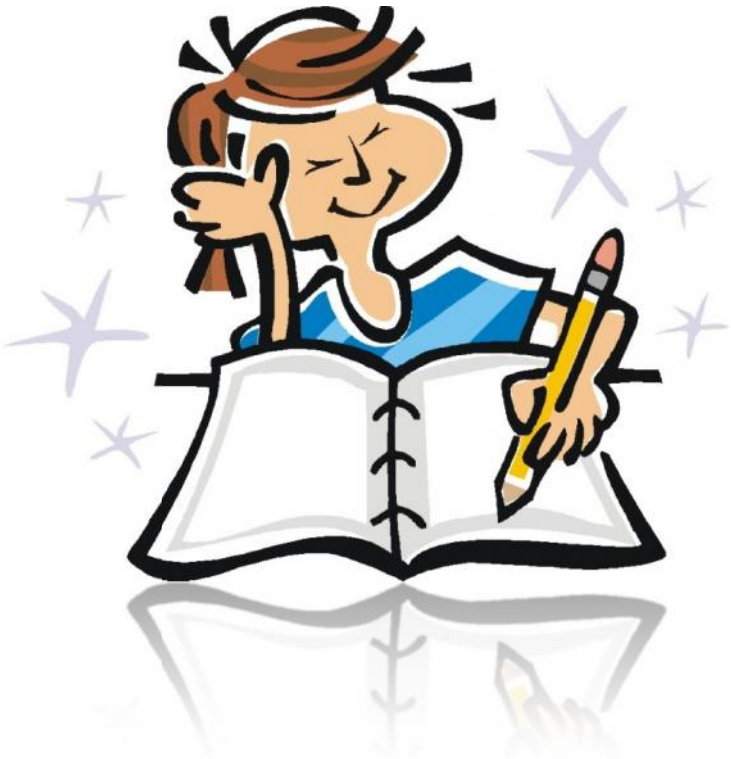

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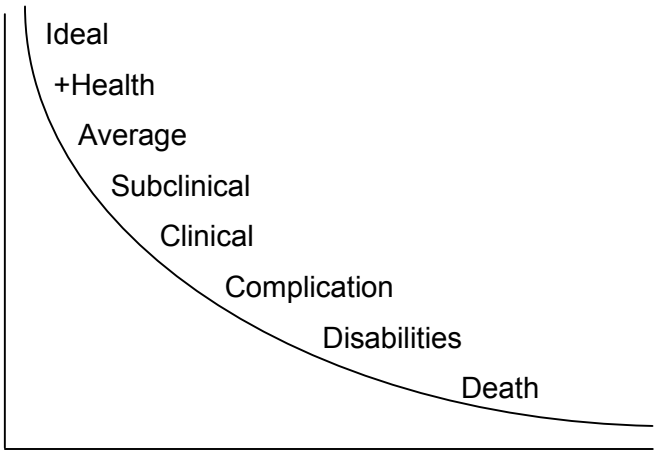
Contents

General Epidemiology

Health and Factors Affecting

Health: Complete physical, mental and social well being not only absence of disease or infirmity.

Levels of health:



Factors affecting health:

1- Host factors
- Age
- Sex
- Occupation
- Marital state
- Residence
- Habits

2- Environmental factors
3- Agent factors
4- Health care system programs

Pattern of the disease:

1- Epidemic: - Sudden
- ↑ Number
- Short duration

2- Pandemic: Epidemic in more than one country " global "
3- Out Break: Large number in closed community > مدرسة – فصل
4- Sporadic: Small number scattered in wide areas.
5- Endemic: Continuous presence of disease.

Epidemiology

Definition: - Science deals frequency of disease among people. Or
- Dynamic distribution of any mass phenomena among people.

Functions:

1- Study of cause
2- Determination of natural history of disease
3- Improvement of Diagnosis, treatment & prognosis
4- Evaluation of Health programs
5- Evaluation of community
6- Identification of case

Chain of infection:

1- Source of infection
2- Portal of exit
3- Portal of entry
4- Mode of transmission
5- Host (state of immunity)

1- Source of Infection

- Inanimate
  - Snail
  - Air
  - Water
- Animate
  - Animals:
    - Dogs > Rabies
    - Cattle > Bovine TB
    - Rats > Plague
  - Humans:
    - **Case:** - Frank illness (mild > sever)
      - Missed = abortive = subclinical in
    - **Carrier:** Person who contain infectious agent, acting as a source of infection and show no symptoms or signs of disease.

Classification of Carrier:

A- according to spectrum of disease

1. Incubatory
2. Contact
3. Convalescent
4. Healthy (subclinical exp)

B- according to duration

1. Transient: few days to few weeks
2. Temporary: 6 m to 12 m
3. Chronic: more than 12 m
4. Permanent: for life as typhoid

C- according to habitat

1. Nasal: streptococci
2. Throat: meningococcal
3. Intestinal: salmonella
4. Urinary: salmonella

Significance of Carrier:

1- Unknown, move freely
2- Large number than cases
3- Long duration
4- Difficult diagnosis
5- Act as continuous source of infection which may cause epidemic out break

2- Portal of Exit & Entry

- Respiratory
- Intestinal
- Urinary
- Trans-placental
- Mechanical
- Open lesion

3- Mode of Transmission

- Direct
- Droplet
- Contact
- Trans-placental
- Indirect
- Arthropods
- Food & water born
- Air born

4- State of Immunity

Definition: Magnitude of immunized person in the community.

Factors affecting:

1- Mass vaccination
2- Previous exposure
3- According to hared immunity pattern of disease **classified into:**

Epidemic	Sporadic	Endemic	Endemic-epidemic
H. immunity > nil	H. imm. > high	H. imm. > medium	H. imm. > fluctuating
1st exp	2nd exp. After short period	Organism circulating	Continuous presence

Incubation Period

Definition: Period between entry of agent and appearance of symptoms & signs of disease.

Duration of incubation period depends on:

- Rate of proliferation of agent
- Virulence
- Dosage
- Immunity

Significance:

- Date of exposure
- Period of isolation
- Pattern of epidemic.
- Evaluation of control measures

Epidemic Curve

Definition: Line graph show the relation of No of cases of an epidemic in defined period of time.

Phases:

1. Evaluation (ascending) phase
2. Peak
3. Decline (descending) phase

1- Evaluation phase:

- Step rise or sharp rise
  - Short IP
  - Rapid spread
  - Low H. Imm.
- Gradual rise
  - Long IP
  - Slow spread
  - Low H. Imm.

2- Peak = angle:

- Acute " steep ascending, decline "
- Broad " gradual ascending, decline "
- Plateau " flat "
  - Sustained source (continuous common source)
  - Ineffective control Mrs.
  - Suitable environment for spread

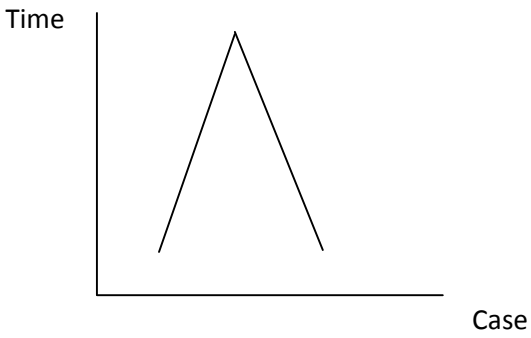
3- Decline phase:

- Steep decline
  - Short IP
  - Effective control Mrs.
- Gradual
  - Long
  - Ineffective

Types of epidemic curve:

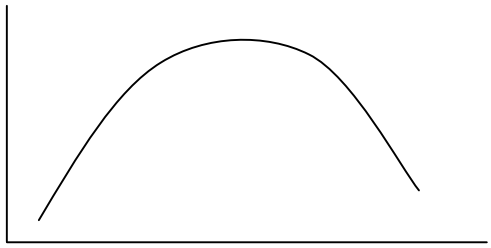
1- Explosive Type = Common Vehicle Epidemic:

- Require vehicle common to community (common source) e.g. water supply
- Characters:
  - + Steep rise
  - + Steep decline
  - + Acute peak



2- Progressive Type = Contact Epidemic:

- Progressive appearance of cases
- Characters:
  - + Gradual rise, decline
  - + Broad peak



Levels of Prevention of Common Disease

1ry prevention: Applied to healthy persons to promote the health, prevent disease.

- General
  - Health educations
  - Health promotions
    - Water sanitation
    - Good nutrition
    - Good ventilation
- Specific
  - Immunization
    - Active
    - Passive
  - Chemoprophylaxis

2ry prevention: Applied to pathogenic people for early diagnosis, proper ttt.

- Screening prog.
- PHC system (public health care)

3ry prevention: Applied to diseased people to prevent complications & eliminate disability by rehabilitation.

- Occupational
- Physical
- Medical

Control of Communicable Diseases

1- Case Control:

1. Identification
2. Notification
3. Isolation
4. Treatment
5. Disinfection
   - Concurrent وهو موجود في المستشفى
   - Terminal بعد مغادرة المستشفى
6. Release
7. Follow up

2- Contacts Control:

1. Enlistment
2. Surveillance (IP)
3. Vaccination

3- Community Control = 1ry prevention

Investigation of Outbreaks

1. Requirement of outbreak occurrence.
2. Harmful agent.
3. Susceptible host.
4. Suitable environment.

Objectives:

1. Ensure outbreak
2. Define population of risk
3. Determine MT, Reservoir and recommended prevention and control measure.

Steps:

1. Confirm occurrence of outbreak by counting NO of cases.
2. Confirm of existence of disease by confirmatory diagnosis.
3. Examine distribution of cases in relation to time, place and person.
4. Postulate a hypothesis by calculation of attack rate among the exposed also among none.
5. Recommendation of proper prevention and control measures.
6. Data collection making reports.

Investigation of Epidemic: as outbreak but:

Instead of step 3 we write “demonstrate the pattern of the disease”

Artificially Immunized Sera:
Used for prophylaxis, ttt (as anti tetanic sera)

Hyper Immunized Sera:
Used for prophylaxis (as rabies)

Gamma Globulin:
Used for prophylaxis (as measles)

Active:
By giving specific Ag to provoke Ab formation

Killed Vaccine:
Whooping cough vaccine

Live Attenuated Vaccine:
polio vaccine

Live Attenuated Vaccine of milder species:
ss bovine TB used in human type.

Capsular Vaccine:
As meningitis

Vaccine by genetic engineering:
Hepatitis B vaccine.

Toxoid:
Modified bacterial toxins Used only prophylaxis as tetanus vaccine.

Extrinsic I.P:
Time taken by agent outside the body to become infective. It may be outside.

Vector:
P. malaria in female anophyline

Intermediate Host:
Snails

Inanimate Soil:
Ascaris egg

Decubation Period:
Time from disappear of symptoms till recovery and absence of agent.

Environmental Factors

Physical:

1. Climatic factors: Temp, humidity, air, rain and atmospheric pressure.
2. Geological factors: Soil, food, water supply, and minerals deposition.
3. Geographic factors.

Biological:

- It includes different kinds of animals and plants.
- It influences diseases causation by presence of etiological agents, presence of vector & reservoir.

Socio-economic:

1. Educational status
2. Economic status
3. Population density
4. Industrialization
5. Medical care facilities
6. Means of transportation

	Eradication	Elimination	Control
Disease	Disappear	Disappear	Decrease
Organism	Disappear	Present	Present

Demography & Measurement of Health

Demography: Scientific study of population including their size, composition, distribution, density, growth and other demographic, Socioeconomic characters.

Count: Absolute number of pop. "or any demographic count" in specific area, time and period.

Rate: Frequency of demographic count during specific time period divided by pop. at risk at same period.

Ratio: Relation of one pop. Subgroup to another (or total pop.)

Proportion: Relation of sub group to entire pop.

Constant: Unchanged arbitrary No. by rate, ratio, proportion multiplied by mono understandable fashion.

Reasons of pop. Explosion: Main reason in this country is development of medicines.

- ↓ MR while BR not drop in same degree
- ↑ Natural increase rate (CBR-CDR)

According to NIR (RNI): Countries divided into:

- Balanced pop: Both CBR& CDR are low but birth rates slightly more small NIR
- Transitional pop: High birth rate& decrease death rate Moderate NIR
- High potential pop: Both CBR&CDR are high (but death is very high) High NIR

Measuring of Pop. Growth

1. **CBR**

$$\frac{\text{No. of live birth}}{\text{Mid year pop.}} \times 1000$$

(No. of live birth = in a given locality/year)

2. **CDR**

$$\frac{\text{No. of live birth}}{\text{Mid year pop.}} \times 1000$$

3. **RNI** = CBR – CDR

4. **Net Migration Rate**

$$\frac{\text{No. of Immigration (الوافدين) – Emigrations (المهاجرين)}}{\text{Total pop.}} \times 1000$$

5. **Growth Rate** = RNI +/- NMR

Indices of Fertility

1. **Crude Birth Rate**

   - Not all pop give birth
   - No. of pop. may decrease (wars or migration)
   - Age composition not same in all countries

2. **General Fertility Rate (GFR)**

$$\frac{\text{No. of live birth}}{\text{No. of child bearing female (49 yrs)}} \times 1000$$

Disadvantage: Different ages of marriage in different countries.

3. **Age Specific Fertility Rate**

$$\frac{\text{No. of live Birth given by mother in certain age}}{\text{No. of female in this age}} \times 1000$$

4. **Total Fertility Rate (TFR)**

   - Summation of 7 age specific fertility rate × 5

5. **Growth Reproductive Rate**

   - TFR × percentage females to total birth (48.4%)

6. **Net Reproductive Rate**

   - Correct draw bath of GRR

Population Problem in Egypt

High population Growth Rate: Increase in pop size resulting from rapid decrease in MR without corresponding decrease in BR.

Continuous increase of RNI (2%):

- Pop. reach 130 × 10^6 by 2035 but
- Effective fertility planning program pop. decrease to 80× 10^6

Factors responsible for increase BR in Egypt:

1- Pattern & Economy in rural areas الابن بيشارك أبوه في الزراعة
2- Social percentage of female
3- High mortality rate قبل ما الجد يموت
4- Poverty

Solution of that problem:

There's no single or rapid solution but all the following are important:

1. Economic development
2. Education of female
3. Increase mean age of marriage decrease reproductive period.
4. Increase quality of MCHC (Maternal Child Health Care) systems.
5. **Family planning** (سؤال لوحده)

   Definition: regulation of each birth process for the sake of child, female, family and community.

   Advantages:

   a. Promote maternal health
   b. Better outcome pregnancy
   c. Family welfare
   d. Management of infertile couples

Q: When family planning program becomes more effective?

a. Concentrated on responding community
b. Available recording system
c. Integration of planning services “health centers as hospitals”
d. Health education
e. Medical student , nurse should be trained on birth control

Demographic in Egypt

☒ Increase pop. Growth rate

☒ Pop. Distribution "4% of areas only "

☒ Pop. Profile:

a. **Age composition**

- < 15 yrs → 40%
- > 60 yrs → 6%
- 15-60 yrs → 54%

b. **Education literacy**

- Illiteracy rate in 10 yrs ≤ 50%
- In females 62%

c. **Marital status**

Q: decrease marital status among pop. reaching legal age of marriage?

- Increase standard of living
- Increase education in females
- Difficult housing

Medical Statistics

Basic steps of statistics methods

1- Collection of data

- Sources of data
- Methods of research (epidemiological methods) هام جدا
- Sampling هام جدا

2- Presentation of data

- Tabulation
- Chart and diagram
- Presentation of quantitative and qualitative data

3- Interpretation of results

- Measures of central tendency هام
- Measures of dispersion
- Significance of tests
- Normal distribution curve (NDC) هام جدا
- Correlation

Sources of data:

1- Available sources

- Census : every 8 yrs for collection of demographic data
- Records of health offices
- Case records

2- Survey

- Def: Data of field study “field visit report”
- Types:
  - Special purpose or multipurpose
  - Local or national
- Steps:
  - Define target pop, time, place of work (PPT)
  - Determine objectives
  - Prepare requirements
  - Approach to community readers, target pop.
  - Exclusion of survey تمثل فى مجموعه
  - Collection, analysis, presentation of data

Presentation of data:

Types of data:

1- Qualitative: describe quality things to be studied

- Nominal: classified into categories e.g. Blood groups لا يحتاج الى ترتيب
- Ordinal: have underlying order يحتاج الى ترتيب

2- Quantitative: measurable

- Continuous: any value on numbers ممكن صحيح او كسر e.g. Age and weight
- Discrete: only integer value لازم صحيح e.g.HR

Presentation of data:

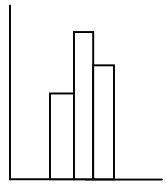
1- Tabulation

a) Simple table

b) Frequency dist. Table

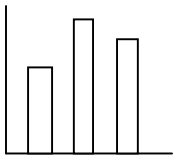
2- Chart & diagram

a) Histogram

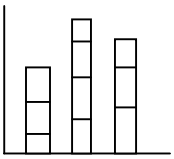


b) Bar Chart

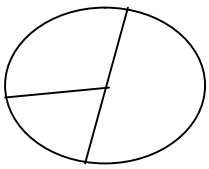
- Simple bar Chart



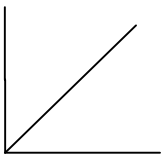
- Component bar Chart



c) Pie Chart



d) Line Graph



e) Pictogram

Normal Distribution Curve (NDC):

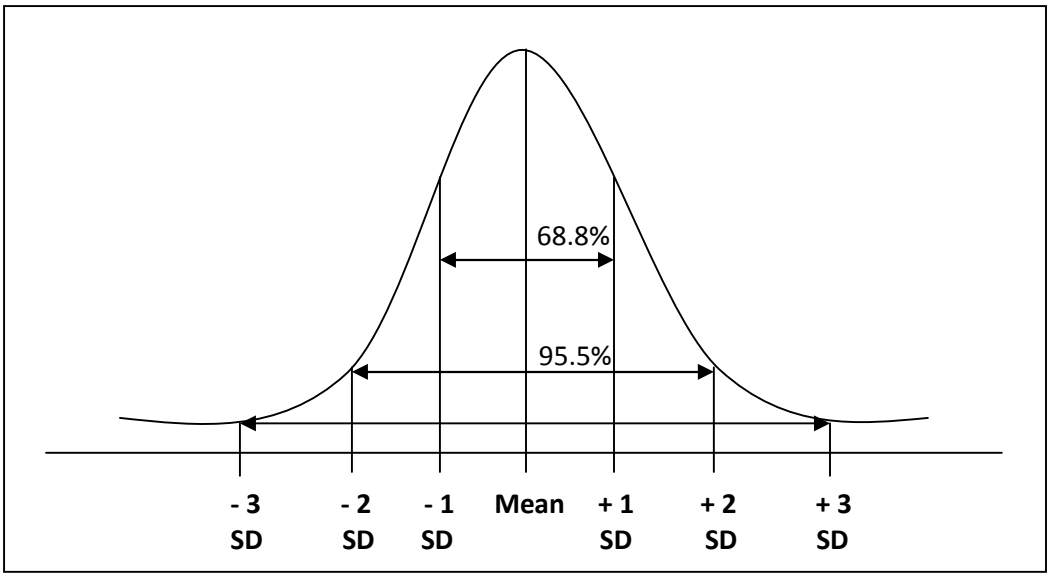
Def: Mathematical model which adequately describes many types of measurement in medicine.

Characters of NDC:

1. Bell shaped curve
2. Symmetrical
3. Has only 2 parameters
4. Unimodel
5. Reach infinity in both sides but particularly it touches the baseline at 3 SD on both sides.

Characteristic property of NDC:

- 68.8% of all observation fall on mean ± 1 SD
- 95.5% of all observation fall on mean ± 2 SD
- 97% of all observation fall on mean ± 3 SD



SCREENING PROGRAM

Def: Testing of apparently healthy individuals or high risk people of certain to detect unrecognized cases.

Confirmatory test needed to confirm result.

Objectives:

1. Early case finding
2. Better control - Prognosis
3. True size of problem can be known
4. Research studies

Types of screening programs:

1. Selective e.g. Hb% for pregnant male
2. Mass screening e.g. MMR for T.B

Requirement of good screening test:

1. Acceptable
2. Rapid (on large No in short duration)
3. In expensive
4. Harmless
5. Easy & simple
6. Valid with good predictive value (accuracy)
7. Reliable (same results with repetitions)

Criteria of screening test:

1. Disease should have:
   - Treatment
   - Public health significance
   - Pre-clinical period
   - Prevalent
2. Early detection of great value in reducing mortality

Validity of screening test: (أعمده)

- Validity means: it can measure what supposed to be measured.
- It has 2 aspects:
  - Sensitivity: ability to diagnose who are diseased
    Sensitivity = True +ve / all +ve disease
  - Specificity: ability to diagnose who are not diseased
    Specificity = True -ve / all -ve diseased

Predictive value of screening tests: (صفوف)

- Used in Evaluation of usefulness of the test to reduce the uncertainty about the absence or presence of disease.
- It has 2 aspects:
  - +ve predictive value: the ability to identify who are truly have the disease (true +ve) from all test +ve individual.
    +ve = True +ve / all test +ve
  - -ve predictive value: the ability to identify who are truly have not the disease (true-ve) from all test –ve individual.
    -ve = True -ve / all test -ve

Example:

	Disease +ve	Disease –ve	total
Test +ve	True +ve (a)	False +ve (b)	a+b
Test –ve	False –ve(c)	True -ve(d)	c+d
Total	a+c	a+d	a+b+c+d

Sensitivity = True +ve/all Disease +ve = a/a+c
Specificity = True -ve/all Disease –ve = d/b+d
+ve = True +ve/all test +ve = a/a+b
-ve = True -ve/all test –ve = d/c+d

Epidemiological Methods

Methods of Research

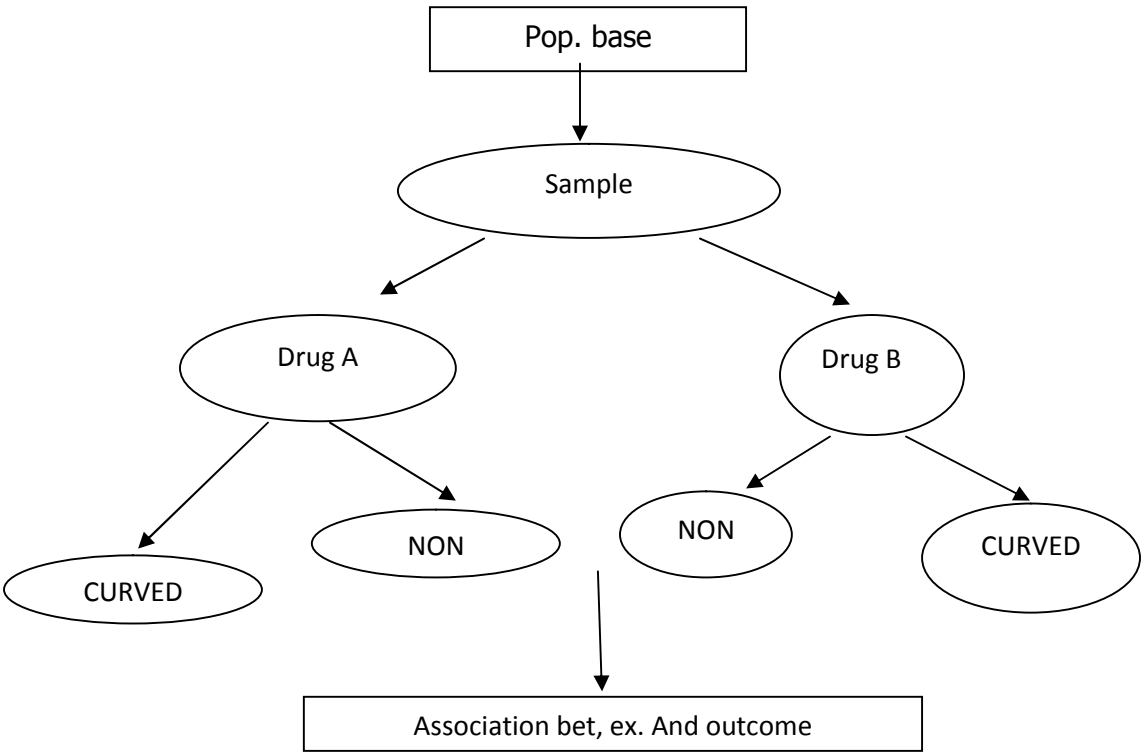
Observational Study:

1. Descriptive Study:
   - Cross Section
   - Longitudinal
2. Analytic Study:
   - Case - Control
   - Cohort

Experimental Study:

Def: Similar in concept to cohort study except in that we induce the character.

Steps:



$$\text{Incidence (معدل حدوث المرض)} = \frac{\text{No. of new cases}}{\text{Pop at risk}} \times 1000$$

$$\text{Prevalence (معدل انتشار المرض)} = \frac{\text{New + old cases}}{\text{Pop at risk}} \times 1000$$

Descriptive Study (تؤكد النظريات):

- Describe pattern of particular disease
- Used largely in Prevalence determination
- Sources of information:
  - Records
  - Interviews
  - Survey

We organize information according to epidemiology variable ppt:

1. Person: who is affected?
   - Age
   - Sex
   - Marital status
   - Ethnic group
   - Family history
   - Occupation
   - Socio-economic level
2. Place: Where is the affection?
   - Rural areas
   - Urban areas
3. Time: When the affection?
   - Long term trend (secular changes) يظهر كل ١٠ سنين
   - Periodic changes e.g. Influenza فى المواسم
   - Epidemics

Time span of descriptive study (Types):

1. Cross sectional study:
   - Observation at certain time periods
   - Prevalence study
2. Longitudinal study:
   - Repeated observation of same community
   - Over long period

Case Control Study

Advantages:

1. Quick
2. Cheap
3. Suitable for rare disease
4. Not need large No pop
5. Multiple risk factors can be tested
6. Used to test Hypothesis

Disadvantages:

1. Incidence can't be calculated
2. Able to baas errors (depend on memory records)
3. Don't differentiate cause from other factors
4. Case group: not represent whole cases in community
5. Control group difficult to be selected

N.B

Odds ratio: Measure strength of association of risk factors & outcome

- Rate of exposure of cases = A / A+C
- Rate of exposure of control = b /b + d
- Odds ratio (A/C) / (b/d) = Ad / bc

Cohort Study

Advantages:

1. Estimate incidence relative risk
2. Test Hypothesis
3. Identify the cause
4. No blasé

Disadvantages:

1. Long Time
2. Expensive
3. Not suitable for rare disease
4. Loss of some persons during follow up due to death or migration

N.B

1. Relative risk: Incidence of exposed / Incidence of non exposed = A/C
2. Attributable risk: Incidence of exposed – Incidence of non exposed = A-C

Samples

During study of pop. problems, we can't study every individual as this is expensive, difficult, consuming time. so we prefer to examine a sample of pop.

Advantages of sample:

1. give more correct information if population louse is too
2. save time, money, manpower
3. easy data collection, analysis
4. no bias

Characteristics of sample:

1. sample frame (complete list of available or prepared uncles study)
2. representative
3. reliable (no unknown individual not refused by them.

Types of sample:

1. Non probability sample:
   a. Purposive sample
   b. Quota sample
2. Probability sample:
   a. simple random sample
   b. systemic random sample
   c. stratified random sample
   d. multistage sample
   e. cluster random sample

Purposive sample:

- Non random sampling
- Chosen according to person own judgment، result can't be generalized
- Used in pilot study or where is difficult to identify people in the group

Quote sample:

-nonrandom sample
-purpose sample
-not used in medicine (used in USA by Gallup institute)

Simple random sample:

- every individual in population sampled has the same probability to be sampled
- done by either
  1. lohery method : if sample frame has small no of units
  2. table of random numbers if sample frame has large no of units
- Disadvantages :
  1. can't be done if size of population is ....
  2. necessity of sample frame
  3. pop. Must be homogenous
  4. increase possibility of wide geographical ..... of selected individuals

Systematic random sample:

- Has similar concept of simple random sample except we select units of (or individual) of sample every fixed interval (if 1/n samp required so, every nth sampled)
- Adv:

Easier to do esp. if the sample frame to large .

- Disadv:
  1. invalid result if the units have cyclic .....
  2. necessity of sample frame
  3. high possibility of geographical dispersion of selected units
  4. pop. Must be homogenous

Stratified random sample:

- Used in heterogeneous pop and wide geographical dispersion
- We divide heterogeneous pop into groups according to main variable of study (age, sex, residence) and each strata sampled independently a known sample fraction.

Multi stage random sample:

- Has similar concept of stratified random sample except stratification on different stages
- Used in large population
- Adv:
  1. Concentration of available on limited No. of sections decrease cost/unit
  2. suitable for absence (difficult) sample frame
- Disadv:
  1. increase errors (increase variability between units
  2. increase difficulty of analysis

Cluster random sample:

- in w pop divided into groups, a sample of groups drawn either by single stage or multistage.
- Adv:
  1. No need for definition of units ,sample frame and selection of sample
  2. decrease cost/unit
  3. more acceptable
  4. more accurate observes
- Disadv: Decrease efficiency of sampling .

Interpretation of data

Measures of central tendency: 3M

1. Mean: sum of observations divided by No of observation
   - (x) mean = x/n
   - (x=values of observation)
   - N= no observation
2. Median: middle number in a series of number arranged in order of magnitude. Median = n+1/2
3. Mode: the most frequent occurring No.

Measures of dispersion: dispersion of data from mean

1. Range: Difference between greatest and smallest value in the observations.
2. standard deviation :

$$SD : \sqrt{\frac{(x-x2)2}{n-1}} £$$

Health & Environment

Environment

Definition: consist of:

- Air
- Water
- Soil

Location: Surroundings e.g. equipment and tools.

Environment sanitation includes:

1. Town planning
2. Housing
3. Air ventilation
4. Water supply
5. Food sanitation
6. Refuse, sewage disposal
7. Insect control

Ventilation

Definition: process of supplying or removal of air from confined space by natural or artificial.

Types:

External ventilation: depends on air around building e.g.

- Main street > 12m
- Side street > 10m
- Height < width of street

Internal ventilation:

- Natural: by window or door
- Artificial:
  - Fans: 1\5 floor space
  - Propulsion system: push air
  - Exhaust air
  - Air conditioning: balanced system

Air pollution

Definition: presence of subs in specific amount & duration in ambient atmosphere which Interfere with welfare of human (animal, plant) being.

Types:

- According to size of environment:
  1. Indoor air pollution: closed env → factory workers exposed to fumes.
  2. Outdoor air pollution: open environment
- According to origin:
  1. Natural air pollution: e.g. dust & smokes
  2. Man made air pollution: due to human action

Classification of pollutant:

- Aerosol, minute, solids or liquid parts (smoke, fumes, dust, mist & fogs)
- Gases & vapors

Effects of air pollution:

- Outdoor air pollution:
  1. Property damage
  2. Soiling of surface
  3. Sky darkening
  4. Limited visibility
  5. Vegetation damage
  6. Annoyance & sense
  7. Health damage
- Indoor air pollution: occupational disease

Prevention of air pollution:

- Indoor air pollution:
  1. Procedure: directed to source → decrease product
  2. Methods: designed to prevent escape of pollutant to atmosphere
  3. Personal protective devices
- Outdoor air pollution:
  1. Cultivation of trees: prevent dust coming from factories
  2. Supplying factors chemicals e.g. Filter
  3. Non pollutant source
  4. Avoid open fine
  5. Motor car maintenance
  6. Proper storage & disposal of producing substances

Water Sanitation

Source of water:

1. Rain water
2. Surface water
3. Underground water (shallow or deep)

Putrefaction of water:

1. Small Scale water putrefaction:
   - BOILING
   - DISTILABEN
   - FILTRATION
   - Ca HYNO
   - Addition of CHLODNE TAB
2. Large Scare H2o Purification Of Tow CHIES
   - Water intake, Pipe Protection, Middle, Midway
   - Coagulation, Sedimentation: Alum Skull 70% Of Contaminated Water
   - Filtration: Slow Sandy Filter
   - Disinfection
   - Water Analysis
3. After Disinfection Phys تكمله من الكتاب

Food Sanitation

1. sugar
2. salting
3. pasteurization
4. smoking
5. freezing and cooling

Droplet Infection

Bacterial	Viral
• T.B • Meningitis • Pertussis • Diphtheria • Strept. Infection	• Mumps • Measles • Rubella • Chicken pox • Influenza

Mode of transmission:

1. Direct: Droplet infection (close contact)
2. Indirect: Air borne
3. Ingestion: Contaminated food

Prevention of droplet infection:

1. General:
   - Health education
   - Health promotion
   - Environmental sanitation: (good housing, good ventilation, avoid overcrowding & dust suppression).
2. Specific:
   - Active immunization.
   - Passive immunization.
   - Chemoprophylaxis.

Meningitis (Meningococcal Meningitis)

Agent: N. meningitis (G -ve – diplococcic - capsulated)

Source: Human: case or carrier (mainly)

N.B

- Carrier rate is 5-10%
- Epidemic period is 20-50%

M.I: Droplet infection

I.P: 2-10 days

Pattern:

- Age: children, young adult
- Sex: ++ in male
- Season: winter - spring
- Environment: overcrowded – ill ventilated places

C/P:

- Catarrhal (N-P stage) FAHM + Respiratory manifestations
- Meningeal congestion: FAHM + flushing
- Meningitis: FAHM + projectile vomiting + photophobia + neck rigidity + confusion + coma + convulsion.
- Signs of meningitis irritation → +ve brudziniski sign

Complications:

1. Cranial nerve palsy
2. Hydrocephalus
3. HF & Myocarditis

Diagnosis:

1. NP swap
2. Blood culture
3. Lumbar puncture

Prevention:

1. General prevention
2. Specific prevention A,B capsular polysaccharide vaccine

Control:

Case	Contact
• Identification • Notification • Isolation • Disinfection • Treatment	• Enlistment • Surveillance • Chemoprophylaxis • Sulphodiazine

Tuberculosis

Agent: M. tuberculosis (T.B bacilli) = Acid fast bacilli

Types:

- Human: pulmonary + ext. pulm
- Bovine: ext. pulm
- Avian: rare

Source:

- Human type: man open T.B
- Bovine type: cattle infected milk or meat

M.I: Droplet

N.B: Response to infection

1. Primary infection: during early stage of life
    - Primary Complex:
        - Johns focus
        - LN enlargement
        - Lymphangitis
    - Fate:
        - Regression: fibrosis - calcification
        - Stationary
        - Progression (rare):
            - Pleura → Pleurisy
            - Lung → T.B pneumonia
            - Bl. V → Miliary T B
            - Bronchi → open case
2. Secondary T.B (Post 1ry):
    - In adult affect upper zone of lung
    - Either exogenous - endogenous - combined.

I.P:

- 4-6 weeks for 1ry lesion
- 1 year for disease to develop

Pattern:

1. Age & Sex: All but increase in young adult male
2. Occupation: increase in patient suffering from lung dust disease (silicosis)
3. Race: increase in Negros
4. Environment:
    - pulmonary increase in urban area
    - Bovine increase in rural area
5. Socioeconomic level: considered a socioeconomic disease
6. Pathological factors: increase in AIDS, DM, pertussis, malabsorption

C/P: No C/P but suspicion is 1/2 the way to diagnose:

1. Loss of weight – fatigue – night fever – sweating
2. Cough – dyspnea – expectoration
3. hemoptysis – chest pain

Diagnosis:

1. Increase ESR, TLC, lymphocytosis, anemia
2. Radiology: X-ray, MMR
3. Sputum examination
    - direct smear ZN stain
    - culture on L.T media, pacbic media
4. PCR
5. Tuberculin test
    - Type IV hypersensitivity reaction
    - I.D test
    - 0.1 ml contain 5-10 tuberculin units = ppD
    - Response: area of induration 10 ml in diameter after 48 hours.

Uses:

1. Case finding program
2. Incidence of T.B
3. Before administration of BCG to adult (-ve only)
4. For contacts
5. Asless BCG vaccine

Typhoid Fever

Agent: S. typhi & S. para (A,B) - G-ve non-motile.

Source: Human as case or carrier

M.I: Ingestion

Pattern:

- Age: young adult
- Sex: ++ in male
- Season: ++ summer
- Env: ++ in company, low sanitary standard

N.B Q: Epidemic in Egypt show seasonal fluctuation?

Ans: It causes major outbreaks in summer due to contamination of fluid.

I.P: 1-3 weaks

C/P:

1. Stage of Invasion:
    - No diarrhea
    - Continuous fever (gradual onset, sleep ladder pattern), Anorexia, headache (most persisting) & malaise.
    - White coated tongue.
    - Relative bradycardia to temp, due to toxic myocarditis
2. Stage of Progression:
    - ++ FAHM
    - There is discomfort, constipation, may be disappear.
    - Rash in 7th day (cause disappear on person)
3. Stage of Regression

Complications:

1. Intestinal:
    - Ulcer
    - Hge → melena
    - Peritonitis

1. Extra Intestinal:
    - Cholecystitis - chronic - non-calcular.
    - Nephritis.
    - Neuritis.
    - Carditis, arthritis → reactive.
2. Carrier:
    - Intestinal
    - Urinary
3. Relapse in 10%

Diagnosis:

1. First weak: Bl. culture on monkey.
2. Second & Third weeks: stool, urinary culture.
3. WIDAL test:
    - Haemagglutation test against O & H agglutinsongen
    - give +ve 7-10 day (2nd)
    - Disappear rapidly → Recent inf.
    - 1/80 H → Old infection = vaccination.
    - 1/80 O → Recent infection.
    - Faulty result: Previous vaccination or inf.
    - Amniotic pattern: Early ttt.

Prevention:

1. General
2. Specific: TAB vaccine → Heat killed vaccine.
    - Each 1 ml contains 1000 x 10^6 S. typhi & 750 x 10^6 S. paratyphi
    - Booster S.C every 1 year.

Poliomyelitis

Types:

- Paralytic
    1. Spinal: A.H.C → Flaccid
    2. Bulbar: motor cranial nerves
    3. Spino-bulbar
    4. Encephalitis
- Non paralytic polio : Picture of meningitis may followed

Precipitating factors:

- Dental & oral surgery
- Injection
- Fatigue
- Immune suppression

Diagnosis of poliomyelitis:

- Clinically: paralytic
- Lab: detection of
    1. AG in stool
    2. AB in serum

Contact control of polio:

- Passive: Ig administration during 1st week
- Active: Vaccination

Prevention:

1. General: droplet & food borne
2. Specific: it can be given from 1 day age till 5 year.

Sabin vaccine	Salk vaccine
• OPV • Used in Egypt • 3 oral doses • Given at 2,4,6 m • 2 drops on base of tongue • Booster at 18,24,School age • Advantages: - Cheap & easy - Give humoral immunity - Herd immunity • Disadvantage: - May causes disease in cases of immune suppression	• IPV • In Developed Countries • 3 IM doses • At birth,1,5 m • Formalin killed vaccine • Booster After 1 year

Diseases Transmitted by Arthropods

1. Anopheles	• Malaria - protozoa
2. Culex	• Filariasis - protozoa
3. Aedes	• yellow fever - dengue fever virus
4. Lice	• Epidemic typhus
5. Flea	• Endemic typhus - murine typhus - plague
6. Sand fly	• Sand fly fever - Lieshmaniasis - protozoa
7. Ticks	• Relapsing fever endemic R.F - rock mountain fever - Ricketsea disease - Lyme disease - End R.F
8. Mites	• Ricketsea disease - Scrub fever

Malaria (Endemic in Sudan)

Agent:

1. Plasmodium ovalae → oval malaria - multicolor
2. Plasmodium vivax → benign tertian – malaria pharoensis
3. Plasmodium malarial → Quartan – malaria sergenti
4. Plasmodium falciparum → malignant – malaria gambi

Vector: Female Anopheles

M/I:

1. Bite of anopheles (sporozite in salivary gland)
2. Bl. Transfusion: infected syringes.
3. Cong. Malaria: transplacental

Pattern:

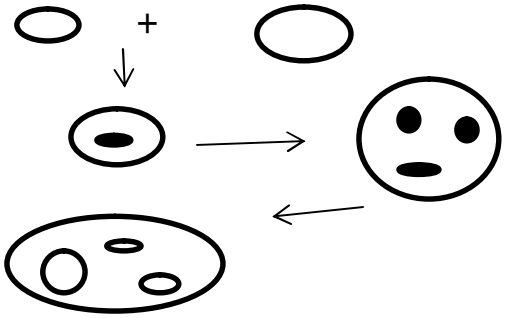
- Age: all age but cause death in children.
- Sex: both sexes
- Season: summer
- Env: rural areas

I/P: 12 days (Q. malaria → month)

C\P: Attack every 48 hours except in quartan every 72 hours:

1. Cold stage: Attacks of shivering, Rigor, shaking chill.
2. Hot stage: FAHM fever stage (41-44 c).
3. Sweating stage: Profuse sweating, ↓ Temp.

Life Cycle:

Sexual	Asexual
• In Female anopheles • Sporogony • Micro Male + Macro Female 	• In Human • Schizogony A. Pre-erythrocytic (liver): sporozite → trophozite → schizont → merozite. (reinvade the liver causing relapsing except P. falciparum) - merozite is also infective B. Erythrocytic: as (A) but in RBCs

Complications:

1. Hemolytic anemia
2. Black water fever (due to haemoglobineuria)
3. Capillary obstruction (stickiness of RBCs).
4. Hepato-splenomegally
5. Jaundice (Obstruction, hemolytic, hepatocenay)
6. Abortion

Fatality rate: 3%

Diagnosis:

Thick bl. Film stained Leishman stain during febral stage specially at 10-12 pm

Elimination of breeding sides:

- Filling and drainage of canal
- turbidity of water

The most effective drug: quinine, meflequine.

Schistosomiasis

Q1: Can S. haematopium cause intestinal or S. mansonai cause urinary?
Q2: Can S. mansoni cause cor-pulmonal as haematopium?
Ans: YES due to porto-systemic anastomosis (vesico-uretric anastomosis)

Life cycle

Circaria → human → eggs → water → hatching → meracidium → snail → IW → circaria → human

C\P: Specific manifestations:

- Sandy Patches
- Cyst
- Ulcer
- Polyp

Complications:

1. Loss of blood → anemia
2. rectal prolapse in intestine
3. Urinary:
   - stricture
   - hydro-pyonephrosis
   - renal failure
   - cancer
4. Pre-portal fibrosis: portal hypertension → opening of P.S.A. → piles, caput medusa & esophegeal varices.
5. Splenomegaly
6. Embolic complication → cor-pulmonal

Leishmaniasis

Agent:

1. L. donovani → Visceral
2. L. tropica → Cuteneas
3. L. braziliensis → Mucocuteneas

Vector: Sand fly

M/I: Biting

Pattern:

- Age: any
- Sex: male
- Season: summer
- Env: migrating worker

I/P: 3 weeks

C\P:

1. Visceral: irregular fever, HSM, weight loss, anemia
2. Cutaneous: skin ulcers → scaring
3. Mucocuteneas: partial or complete mucus membrane destruction

Complications:

1. Permanent scars
2. Pneumonia
3. Septicemia
4. Dysentery
5. Carcinoma

Prevention

Control: Visceral: neostiban or stibogluconate which is drug of choice.

Filariasis

Agent: W. bancrofti

Vector: Culex

M/I: Bite by mosquito containing filariform larva

Life cycle: book

Pattern:

- Age: any
- Sex: both
- Env: Rural
- Season: summer

C\P:

1. Early: lymphangitis, lyphmadenitis
2. Late: lymphatic dilatation → lymph varies → damage → elephantiasis

Complications: Special hardship

Diagnosis: detection of microfilariae in peripheral blood

Prevention & control

TTT: Hetrazan

Yellow Fever

Agent: Yellow virus → encapsulated RNA

Vector: Aedes

M/I: Bite of mosquito

Pattern:

- Age: any
- Sex: male
- Env: urban
- Season: summer & spring

I/P: 6 days

C\P:

1. Acute infectious stage: FAHM + nausea, vomiting and myalgia
2. 24 hours remission stage: fever and symptoms abate
3. Toxic stage: jaundice, oliguria, hematemesis, melena

Complications:

1. Liver failure
2. Renal failure
3. Pulmonary edema
4. Myocarditis
5. Encephalitis

Diagnosis:

- Leukopenia
- Liver function tests

Prevention & control: book

Fatality: 5-10%

Plague

Agent: Yersinia pestis (non motile, pleomorphic, gram –ve coccobacilli)

Vector: Rat flea (xenopsylla)

Reservoir: Wild rodents

M/I:

1. Flea of Rat
2. Droplet
3. Contact

Pattern:

- Age: any
- Sex : male
- Env: Rural

I/P: 6 days

C\P:

1. Bubonic plague: fever, vomiting, coated tongue, focal lymphadenopathy
2. Septicemic plague: FAHM + meningitis, hypotension
3. Pneumonic plague: fever, hemoptysis, dyspnea, chest pain, tachypnea

Complications:

1. DIC
2. Meningitis
3. Pneumonia

Diagnosis:

- Clinically
- Blood, sputum exam by Geimsa stain

Prevention:

1. Otten's vaccine:
   - Nature: live attenuated
   - Dose: 1 ml SC
   - Duration: 6 m immunity
2. Formalin inactivated vaccine: cause severe inflammatory reaction
3. Chemoprophylaxis : tetracycline 2gm \ day

Control & TTT: Streptomycin is drug of choice

Fatality:

-Bubonic → 16% -Septicemic → 30-50% -Pneumonic → 100%

Diseases Spread by Contact

STDs (Venereal diseases)	Non STDs
1. Bacterial • Syphilis • Gonorrhea 2. Viral • AIDS • HBV • HSV(11) 3. Fungal • Moniliasis 4. Parasitic • Trichomoniasis	1. Anthrax 2. Scabies 3. Erysiplas 4. Leprosy 5. Tetanous 6. Gas gangrene 7. Rabies

Pattern of STDs (Risk Fs):

1. Age: active sexual period
2. Sex: increase incidence in male(but female are more symptomatized)
3. Env: in rural & urban areas and low socio economic(ilitracy, poverty, decrease sex education, delayed age of marriage and decrease STDs control program)
4. Occupation: increase in sea men(divers)
5. Race: increase in coloured race
6. Habits: commonly associated with drug abuse(alcoholism)

Prevention and Control of STDs:

1. Sex and Moral education
2. Socio economic development
3. Encourage of deront
4. Encourage of marriage at suitable ages
5. Premarital, prenatal screening of STDs
6. Case finding program
7. STDs control program
8. Eradication of prostitutes
9. Control of high risk
10. Legislation

Acquired Immune Deficiency Syndrome (AIDS)

Agent: HIV (lymphtropic virus esp.CD4 cells "T-helper")

Source: Human as a case (symptomatic or asymptomatic)

M/I: parenatal - sexual - vertical

Risk group:

1. Homosexual : heterosexual with multiple partner.
2. IV drug abuser.
3. Patients with blood transfusion and organ transplantation.
4. Hemodialysis patients.
5. Children to infected cases.

C/P: AIDS stages:

1. Stage of acute infection:
    - Nonspecific respiration and GIT manifestation
    - Transient lymphadenopathy
2. Asymptomatic stage:
    - Latent period vary from few months to few years
3. PGL(Persistent Generalized Lymphadenopathy)
4. AIDS Related Complex(ARC)
    - FUO &minor oral infection(cardida, HIV)
    - Chronic diarrhea, loss of weight
    - HSM
    - Lymphadenopathy
5. AIDS Opportunistic infection malignancy:
    - Opportunistic infection
    - Opportunistic malignancies: Kaposi Sarcoma, NHK lymphoma &cerebral lymphoma.

Diagnosis:

1. Decrease TLC: with marked decrease in CD4.
2. Screening test: ELISA
3. Confirmatory tests: Western blot test & RIPA test.

Prevention: (prevention of STDs)

1. Prevention of AIDS via Blood:
   - All blood donors :screened for HIV
   - Highly risky group: excluded from donors
   - Use of :heat leaked Factor 8,9 for hemophilia
   - Avoid: acupuncturs, tattoing, ear piercing, sharing syringes, tooth brush
2. HIV +ve female:
   - Adviced against pregnancy.
   - If come preg. Lead to terminate of pregnancy.
3. All HIV +ve cases:
   - Shouldn't receive live Vacci.
   - When admitted to hospital manipulated as HBV +ve (full precautions for secretion.
   - No specific Vacc.
   - HIV +ve case not infectous in other ordinary social &family setting.

Hepatitis Viruses

	HAV	HBV	HCV
Agent	HAV (RNA)	HBV (DNA)	HCV (RNA)
Source	Human as case	Human as case or carrier	Human as case or carrier
M.I	Ingestion	Parentral Sexual Vertical	Parentral May be Sexual
I.P	2-6 W	2-6 M	1-2 M
Pattern • Age • Sex • Env	↑ Children both sexes Low Socio	↑ children & adult ↑ males ↑ Risky group	↑ adult ↑ males ↑ Risky group
Diagnosis	• Detection of Ag in stool. • Detection of Ab in serum. • ↑ LFTs	• HBV markers • PCR • ↑ LFTs	• HCV Ab • PCR • ↑ LFTs
C/P	• Asymptomatic • Symptomatic - Pre-ectric - Ectric - Post-ectric		
Prevention	1. General • Food born	1. General • Blood born	1. General • Blood born

	1. Specific ❖ Active • Live attenuated Vaccine • 2 S.C with 1 m interval. ❖ Passive • Ig in the 1st week after exposure.	1. Specific ❖ Active • HBV Vaccine - Plasma derived - Yeast derived	1. Specific No Vaccines.
Control	1. Case 2. Contact	1. Case 2. Contact	1. Case 2. Contact

Tetanus

Agent: Tetanospasmin (exotoxin) of C. tetani

Source: Intestine of man & animal

M/I: Contamination of wounds with soil infected with spores

Pattern:

1. Age:
   - neonatal tetanus responsible for death of 50% of delivery birth
   - other type common in adult
2. Sex: increase in males
3. Environment: rural agriculture areas

Local: Favour release of toxin increase humidity lead to decrease Bl supply & decrease O2 → tissue necrosis

I/P: 1-3 weeks

Clinical type:

1. Tetanus neonatorun infected stump of umbilical cord
2. Puerperal tetanus : post delivery& post abortion
3. Post operative tetanus : unsterilized instruments
4. Post traumatic tetanus
5. Idiopathic : with no wounds

Clinical picture:

1. In tetanus neonatorum difficult suckling (trismus)
2. Spasm of muscles at site of infection
3. Stiffness of maseter muscle (trismus) & jaw muscle (locked jaw)
4. Which descend to neck &body
5. Escape smile (spasm of facial muscle)
6. Dysphagia & dysphonia & asphyxia
7. Hyperreflexia & convulsion

Prevention:

- For tetanus neonatorum and puerperal tetanus:
  1. Hygiene birth : performed qualified persons
  2. Post natal care :of umbilical cord
  3. Health education
  4. Maternal immunization
     - 1st → 3rd month: immunization of all preg.= 2 dose
     - Last → 7th month:
       - tetanus toxoid = one month apart
       - Single dose of subsequent preg.
       - single dose every 5 years → lifelong protection
- For other types:
  1. Proper sterilization : care of wound
  2. Active immunization:
     - Formal toxoid (3 s.c doses e 1 m. intervn)
     - Alum. Ppt toxoid (2 s.c doses e 1 m. intervn)
     - DPT 2,4,6,18m and booster & possible immunization at school age.
       - Anti-tetanic serum for wounded person (1500- 5000 U) I.V ← I.M
       - Tetanussg.(250 U) I.V

Control:

1- Identification
2- Notification , isolation (no person to person infected)
3- Anti-tetanic serum 50 X 10 000 U I.V
4- Penicillin , sedative 9 ms relaxant

Rabies

Agent: Rabies virus (RNA virus) (sheet(produce) , fixed forms (not produced))

Source: Rabid animal

MI: Bite of rabid animal

Pattern

- Age: in adult
- Sex:
- GD worldwide ex up
- Env: Low socio-economic

I/P:

- Variable depend on site of bite
- In 90% of cases 20-90 days

C/P:

- Prodromal symptoms
- Followed:
  - Itching at site of bite
  - Non-specific symptoms FAHM + myalgia
- Furious rabies: (excitatios alternate lucid interv)
  - Hydrophobia - aerophobia
  - Opisthotonus - cranial n. Lesion
  - Fluctuation of temp & bl. Pr.
- Paralytic rabies: Flaccid paralysis of bitten limb is extend to respiratory & swallowing ms → fatal

Diagnosis: Detection of viral Ag (Negri bodies) in Brain smeal of rabid animal.

Prevention:

1. Rabies vaccines:
   - Animal vaccine MC. Flurry vac (the vacc)
   - Human vaccine
     - Inactivated virus → HDCSV : 0,3,7,14,30 (IM)
     - Live atten → semplevacc : 14-21 s c injection
   - Passture vac
   - Duck embryo vac
2. Anti-rabies serum (sg) : for persons with severe multiple bites
   - 20 – 40 IU/Kg: ½ dose flushed locally
   - ½ IM 5 – W - /38 Vacc
3. Eradication of stray animals
4. Vaccination of owned animals
5. Quarantine for imported animals
6. Measurements for bitten persons
   - Local:
     - Cleaning
     - Antiseptic
     - Avoid unnecessary suture
     - Anti rabies serum
   - General:
     - Anti titanic serum
     - If animal arrested prevented till manifestation appears → start vac
     - If animal no arrested or bite severe → start vacc .
   - Anti-rabies serum: 20 – 40 IU/Kg
     - Half the dose is put on the wound
     - The other half is given I.V

Tetanus	Rabies
Small muscle	Large muscle
Risussardonicus	opistonus

Occupational Health

General concepts:

- Occupational Health: promotion and maintenance of highest degree of physical, mental and social well being of workers in all occupations.
- Routine job: work activity performed at least once/week
- Occupational disease: resulting from exp. To specific agent in work place
- Work related disease: aggravated by work place exp.
- Labor & work:
  - Labor: mindless work directed by others.
  - Work: self - directed and creative work.
- Hazard and risk:
  - Hazard: agent which can cause harmful effect = potential cause of harm.
  - Risk: probability to produce harmful effect = likelihood to cause harm.

Members of occupational health team:

- Physicians
- Practitioner
- Nurse
- Occ. Nurse
- Hygienist
- Psycho sociologist
- Toxicologist
- Microbiologist
- Epidemiologists
- Safety engineer
- Lawyers

Functions of Occupational Nurse:

1. Identification of hazard
2. Presenting information
3. Assessment of time of management
4. Observation
5. Health education

Functions of Occupational Physicians:

1. Clinical services:
   - Pre-employment medical examination
     Value:
     - Put workers in suitable job
     - Health education
     - Collection of data
   - Periodic medical examination
     Value:
     - Periodic follow up and assessment
     - Early case finding
     - Periodic data compound and pre-data:
       - Indices of health st.
       - Evaluation of H. Service
       - Extent disability
   - Medical ttt : D & ttt of common diseases
   - 1st Aid
2. Preventive services:
   - Health education: type of job, hazards, control
   - Immunization: prevention & control of infective diseases
   - Supervision of: nutritional & env. conditions
   - Investigation of: cause of absenteeism غياب مطول
3. Rehabilitation: of disabled worker:
   - Occ: change job & compensation
   - Medical: physical and psychological
4. Record keeping:
   - Individual medical record
   - Record of attendance to clinic
   - Statistic record for dis. & absenteeism
   - Notification record for any injury or occ. dis

Cold

Occ. Exp:

- Ice cream maker
- Frozen food maker
- Fishermen

Effect:

- Acute inflammation of skin (dermatitis) due to ischemia
- Trench foot & immersion foot
- Frost bite
- Predisposed to Resp. Infection

Prevention: erg → air conditioning - isolation

Training:

- Pre-emp .exam.
- Work hours
- Personal Protective Equipment (PPE): gloves & boots

Vibration

Types & Exposures:

- Vehicle body vibration: WBV : vehicles seat, construction buildings
- Hand up vibration: HAV : pneumatic , electric hand tools.

Effect:

- WBV: prolonged exp. Predisposed to:
  1. Musculoskeletal disorder: e.g. disc-deformity & low back
  2. CVS: ↑HR,↑IMD ischemic heart disease
  3. CNS: Headache, fatigue, irritability
  4. Reproduction :
     - ♂ : impotence, prostatic dysfunction
     - ♀ : abortion, menstrual dis.
  5. Vibration sickness , vomiting , vertigo
- HAV: hand, arm vibration S = vibration
  1. Induced white fingers → pain, cyanosis, ischemia

Prevention:

1. desire
2. Health education
3. Vibration
4. ↓ exp. Time: pre-emp. exam periodic/x-ray on spinal cord/finger count

Pressure → Decompression Disease (caisson disease)

Exp: Sub. Aqueticeng, Divers, pilots (discarding)

Effect: Occur during decompression (rapid return) → nitrogen bubbles (emboli) in pulmonary vessels → Rupture → pneumothorax, emphysema.

C/P:

1. Parasthesia
2. Numbness
3. Pain in muscle, bone & joint
4. CNS: Vertigo, Cranial n. affection, stroke & coma
5. Asphyxia & death

Prevention:

1. ↓ exp. Time (short shift)
2. Slow, gradual decompression → engineering
3. Proper pre-emp. Examination
4. Divers inhale mixture of O_2 & helium (diffuse rapidly in bl)
5. Compression and decompression (slow and gradual)
6. ID label

Electricity

Definition: passage of electric current from high voltage to low

- Electro caution (death from electric shock)
- Electric shock
- Burn
- Falls

Noise

Definition:

- Noise: unwanted sound (db)
- Sound: fluctuation of ambient pressure (HZ) → sound pass in air as waves

N.B

- Human ear hear from 20 : 20000 HZ
- Speech range 500 : 3000 HZ
- TwA of Noise is 90 dB but conservation prog start at 85 dB
- Human ear has dynamic range from 0 : 120

Exp: e.g. Iron & Steel industries.

Types:

1. Wide band noise : زى غرف النسيج weaving roar
2. Narrow band noise : زى المنشار الكهربائى circular sac
3. Impulse noise : زى الطلقات والشكوش Hummer &gun shot)
4. Impact noise : sudden with high pr اكبر من 140 dB → sudden hearing loss

Effect :

- Auditory
  1. NIHL: noise induced hearing loss
  2. Tinnitus
  3. Vertigo
- Non auditory
  1. Hypertension
  2. Hyperadrenalism
  3. Hyperpituitarism
  4. Increase risk of CHD
  5. Increase risk of PVD
  6. Increase risk Preterm labor

Prevention:

Engineering	admin	PPE
• Enclosure machine • Increase spaces bet. machine or workers • Barrier bet. machine	• Avoid addition of equipment • Permissible noise - hours • Health education • Pre - Periodic exam	• Must attenuate noise to 90 dB • Ear plugs (85-115dB) • Ear muffs (90-120dB)

Radiation

Ionizing Radiation: emitted from radioactive structure

- Energized particles : alpha - Beta rays
- Energized GM wave : Gama - X rays - electromagnitic

Occ. Exp:

1. Medical feild (diagnostic - therapeutic)
2. Industrial feild.
   - Petroleum refinery worker
   - Atomic E worker
   - Sterilization
3. Research field
4. military persons

Effect:

1. acute exp: acute radiation
   - Japan atom bomb survivors.
   - Gene - chromosomal aberration.
2. Chronic exp:
   - bleeding diseases → decrease WBCs - coagulation
   - Reproduction:
     - Male: decrease sperms - sterility
     - Females: teratogenecity .
   - Skin: Erythema resemble sun burns
   - Decrease thyroid function
   - Cancers e.g. leukemia - lung - bone

Prevention:

1. Proper storage - disposal of radioactive material
2. Barrier bet. source - workers
3. Env monitoring (dosimeter - film badge)
4. Pre - Periodic exam (CBC)
5. Decrease time of exp.
6. PPE = clothes = lead aprons

Non Ionizing Radiation:

1. UV rays (5%):
   - Skin
     - sun burn
     - acbinic skin (wrinkled - dry - not elastic)
     - premalignant & malig
   - Eye
     - photo keratoconjunctivits
     - cataract
2. Visible light (40%):
   - High Lightening: Eye damage (Retinal or macular)
   - Poor Lightening: Eye strain = asthenopia = irritation - Headach - fatigue
3. IR Radiation (55%):
   - Skin: have own warning mechanism
   - Eye: have no warning mechanism (glass blower – cataract)

Laser

- Eye → retinal & ocular damage
- Skin → vary from erythema to scarring

RF (rather fordium) – Microwaves:

- Changes in histamine levels
- Alteration of hormones and enzymes.
- Leukocytosis or thrombocytopenia
- Decrease sperms or increase abortion.

Pneumoconiosis

Definition: Dust in lung (non infective granuloma)

Classification according to tissue reaction:

1. Major pneumoconiosis fibrosis (silicosis & asbestosis)
2. Minor classification constriction
   - Immunological induced air way constriction (asthma)
   - Pharmacological
     - byssinosis = cotton
     - Farmer lung = spores
     - Bagassosis = cellulose
3. Benign pneumoconiosis: no tissue reaction as Fe. Br.

Prevention:

1. Presence of washing facilities
2. Replacement of damage material
3. Dust suppression
4. Health education.
5. Personal protective device

Asbestosis

Definition: chronic fibrosis of lung due to inhalation of asbestos.

Occ. Exp: asbestos product manufacture.

Mechanism of action: Mechanical effect:

1. Asbestosis = diffuse fibrosis
2. Pleural fibrosis - mesothelioma
3. Bronchial

C/P:

1. soB, cough, Exp. asbestos bodies in sputum
2. Weakness, ↓ weight, clubbing of finger

Investigation: X ray → ground glass appearance

Complication:

1. TB
2. Cor pulmonale

Silicosis

Definition: chronic fibrosis of lung due to inhalation of silica.

Occ. Exp:

1. metal mining
2. glass industry
3. sand stone cutting

Mechanism of action: many theories explain fibrogenic effect:

- Mechanical
- Chemical
- Immunological

most accepted one: alveolar macrophage digest silica → die liberate silica → fibrosis silica nodules (upper lobe, hilar LNs more affected)

Diagnosis:

- Occupational history
- Clinical exam
  - Early: asymptomatic
  - Late: cough 'Exp' soB

Investigation: PFT decrease vc obstructive (associated chronic)

- BL ANA +ve
- RF +ve in son
- X ray:
  - simple opacity < 1cm
  - complicated opacity > 1 cm

Complication:

1. TB
2. Cor pulmonale

	Chronic Lead poisoning (Plumbism)	**Chronic Mercurial poisoning (Mercuralism)**
Occ. Exp:	1. Lead mining 2. Painting batteries cenamicidnth	1. Thermometer 2. surgical dentis using
C/P:	1. CNS: encephalopathy PN foot - worst drop 2. CVS: • ↑ BP • Anaemia punctate essinophilia • ↑ levolonic acid in bl • ↑ Corpoprophyrine in urine 3. GIT: • Blue line in gums • Colic, anorexia • Constipation 4. Kidney: Nephritis	1. CNS: tremors 2. hyperkeratinization, Erythema 3. GIT: • Salivats • Gray line in gums • dysentery 4. kidney: GN
Rout of entry	1. inhalation 2. may skin absorbtion 3. ingetion	- Inhalation
Prevention		

Child Health

Definition: Infant below 1 year, pre-school age (2-5 years).

N.B

- Infant ≤ 1year
- Neonate = 1st 4week
- Post neonate = 1st m → 1year

Objectives:

1. Health promotion
2. Decrease morbidity, mortality
3. Prevention of congenital diseases
4. Control of acquired disability
5. Rehabilitation of handicapped

Outcome of pregnancy:

- Favorable outcome: delivery of normal infant without materno-fetal compl.
- Unfavorable outcome:
  - lethal outcome: abortion, stillbirth, IUD
  - Sub lethal outcome: LBW, MR, cong. Anomalies
  - Etiology:
    - Maternal: increase or decrease age, toxemia, infection, nutrition, medical
    - natal: birth injury
    - fetal: chromosomal, genetic

Child health program

Responsible place:

- Rural areas: rural health unit
- Urban areas: MCHC

Component:

1. Registration, record keeping.
2. Periodic exam
3. Immunization.
4. Nutrition comp, breast feeding
5. H. education for mother → periodic exam, proper care, good nutrition.
6. Ttt of sick children.
7. Social comp.

Program start from p & g including:

1. Prenatal & natal cone.
2. Neonatal cone → aseptic cutting of U.C.
3. Periodic follow up in MCHC.
4. Child immunization.
5. Breast feeding, proper nutrition.
6. Growth monitoring.
7. Health checkup.
8. Health education → for mother.

Child health problems :

1. High mortality
2. High morbidity:
   a) Communicable diseases:
      - Cong: rubella, toxoplasmosis (TORCH)
      - Neonatal: tetanus, RH, GE.
      - Childhood: GE, RH, viral infection, parasite inf.
   b) Malnutrition (PEM) protein energy malnutrition, Iron deficiency anemia and rickets
   c) Accidents
   d) Social problem
   e) Handicapping:
      - Def: disability which interfere with development of physical and emotional state
      - Etiology: congenital and acquired (infection and accidental)
      - Types: blindness, deafness, speech disorder, education (subnormal), paralysis.

N.B Person conducting delivery:

- Daya
- Midwife
- GP
- Specialist

Inter Conceptional Cone

Definition: cone of female, infant inbet. Preg (often delivery)befor next preg

Objectives:

1. Restoration of maternal health
2. Family planning
3. Precautions of female after other pregnancy

Include:

1. Nutrition
2. Health education
3. Birth spacing

Impact of birth spacing:

- on maternal health: unwanted preg, MMR, morbidity, preg. loss
- on child: infant morbidity, mortality, inadequate breast feeding
- on community: food, housing, education

Prevention:

1. Natal and ante natal care
2. Immunization
1. Health education
   - nutrition: balanced adequate diet
   - personal hygiene
   - drug
   - alarming signs
   - child case

Control:

- Identification
- Rehabilitation

Infant Mortality

Definition: No of death of infant less than one year

$$IMR = \frac{\text{No. of death below 1 year}}{\text{Live births}} \times 1000$$

Etiology:

1. Congenital
2. Acute RIT
3. Gastro-enteritis
4. Labor complication
5. Generals: (nutrition, decrease social)

↓ IMR:

1. Good MCHC
2. Improvement of nutrition
3. Increase socioeconomic
4. Control of communicable disease
5. Use of ORS for GE

Growth monitoring longitudinal follow up of child measured in items of kg\cm

1. Weight:
   - 1st year
     - at birth: 3-3.5 kg
     - 1st 4 ms: 0.75-3
     - 2nd 4ms: 0.5-2
     - 3rd 4ms: 0.25- 1
   - 2nd year age → (1 year) × (2+8)
2. Height:
   - at birth → 50 cm
   - 1st year → increase by 50%
   - 2nd year → increase by 12 cm
3. Growth chart:
   - Periodic weighing
     - at birth → start
     - 1st year → once\month
     - 2nd year → once\2 ms
     - 3rd year → once\3ms
   - Chart give information

Health Care System

Health System Programs

Functions: POMP

1. Production of resources:
   - Man power: physician, pharmacist, nurses.
   - Money: without money nothing can be done.
   - Material, equipments, drugs, machines.
2. Organization: facility & knowledge:
   - Arrangement of sourced into programs in response to Health problems government (MOH).
   - Programs conducted either by private agencies.
3. Management: HCS cannot continuous without good management.
4. Provision of health services:
   - Primary health services:
     - Prevention
       - HE
       - Environmental sanitation
       - Immunization
       - MCHC
       - Periodic examination
     - TTT Curative
       - many health problems
       - complex one referred to 2ry, 3ry
   - Secondary health services:
     - Diagnosis
     - Treatment of diseases
   - Tertiary health services: Require high degree of skills and technology

N.B Mixture of socialist system of developed counties, non socialist sys of developing counties

Primary Health Care

Definition: Essential health care based on practical, scientific, sound, social acceptable method to individual and their family in the community.

Significance:

1. Health state of any community depend on PHC
2. It's the base on which 2ry or 3ry services are built
3. It's the key for acceptable level of health
4. It's the 1st contact between persons and HC system

Elements:

1. Promotion
2. Prevention
3. Treatment

Levels of Service Delivery:

1. Family , home , proper environment
2. Community : HC and control of epidemic
3. 1st health facilities MHC programs
4. 1st health ufesal levels

Characters:

1. Acceptable
2. Accessible
3. Comprehensive شامل
4. Include community participation
5. Include health related sectors تعليم وغيره
6. Depend on good system
7. Free charged

PHC in Egypt:

- In urban (45%)
  1. Health office
  2. MCH centers
  3. School health units
  4. Urban health centers
- In rural (55%) (rural health unit: small unit help near persons)
  1. Minor operation
  2. School health
  3. MCH

Urbanization: Migration of individual from rural areas to urban areas.

Reproductive Health

Definition: Complete care of female during child bearing period (15-49) years.

Objectives:

1. Promotion, protection and maintenance of maternal health before, during pregnancy, labor, puerperium & lactation.
2. Early detection & ttt of health problems.
3. Decrease of maternal mortality rate.

Maternal health problems:

1. Young age of marriage, high parity & decrease interval between births.
2. Malnutrition: anemia & osteomalacia.
3. Low socioeconomic & illiteracy.
4. Unsanitary environment.
5. Inadequate maternal care.
6. Medical problems: e.g. DM, Hypertension

MHC program includes:

1. Pre-marital care.
2. Pre-conception care.
3. Pre-natal care.
4. Natal care.
5. Post-natal.
6. Interconception care.

N.B (Safe motherhood):

Definition: Female able to go safely through preg, labor, good outcome (infant)

Principles:

1. Antenatal care to prevent complication of pregnancy.
2. Safe delivery to decrease complication of labor.
3. Family planning to decrease unwanted pregnancy.

Pre-marital health care: care of young females from birth to age of marriage.

Objectives:

1. Health education.
2. Health promotion.
3. Prevention of health hazards in young age.
4. Prepare females for pregnancy.
5. Prepare partners for marriage → health family life.

Procedures:

1. History:
   - Personal - gynecological history
   - Medical
   - Family (DM, genetic)
2. Examination: for detection & ttt of any disease.
3. Immunization: MMR, DPT & HBV.
4. Investigations:
   - Blood → RH factor
   - HBV
   - HIV
   - Urine & stool
   - Radiology → Chest X-ray for T.B

Pre-natal (antenatal) care: Care of pregnant female before labor.

Objectives:

1. Health education: about pregnancy, alarming sign, nutrition, child spacing & infant care.
2. Health promotion.
3. Prepare frmale for labour.
4. Prevent hazards of pregnancy, decrease MMR & decrease infant mortality rate.

Procedures:

- First visit (Registration)
  1. History:
     - Personal
     - Medical
     - Family (DM, genetic)
     - Gynecological: 1st day, LMP, regularity
     - Obstetric: prevent delivery complication
  2. Examination:
     - General (weight, height, ABP, pulse, temp& nutrition).
     - Systemic (heart, chest, abdomen, breast & liver)
  3. Investigations:
     - Blood: Hb, ABO, RH & Bl. sugar
     - Urine: albumin & glycosuria

- Subsequent visits (periodic visits)
  - 1st 6 months → once monthly.
  - 7th – 8th → once every 2 weeks.
  - 9th month → once every week.

  1. Examination:
     - General (weight, abdominal, ABP)
     - Local (obstetric) - progression of pregnancy
  2. Investigations: Urine → albumin

Diseases Spread by Food & Water

Bacterial	Viral
• Shigella → Dysentery • Salmonella → Typhoid & Poisoning • E. Coli → Colitis • V. Cholera → Cholera • H. Pylori → Peptic Ulcer& Gastritis • Jejuni → Gastro-Enteritis	• Hepatitis A,E • Polio • Rotavirus • Echovirus • Coxakevirus • Adenovirus

Typhoid Fever

Agent: S. typhi & S. paratyphi

Vector: Human as case or carrier

Carrier:

- Acc. to habitat → Urinary
- Acc. to time → Incubatory, Contact, Convalescence.

Mode of Transmission:

- Food & Water Borne
- Droplet
- Contact

Pattern:

- Age → Any
- Sex → Both
- Environment → Rural
- Season → Summer

IP: 1-3 weeks

C\P:

1. Stage of invasion: during which the organism settle on payer's patch especially of ileum.
2. Stage of progression: phagocyte engulf the organism then ruptured releasing the deed organism and its toxins.
3. Stage of regression: R.E.S. overcomes manifestation.

Types of fever

- Intermittent
- Retar-mittent
- Continuous

Widal test: Faulty results:

- –ve → early TTT or early diagnosis
- +ve → Prevention, vaccination, immunized or amnestic reaction in which the fever elevate the whole body antibodies .

Vaccination: Single IM vaccine - live attenuated.

TTT of Cholera case

1. Drug of choice: chloramphenicol 750mg
2. Recently: quinolone
3. Co-trimethazole
4. Azithromycine for child
5. 3rd generation cephalosporin

Poliomyelitis

Types:

- Paralytic
    1. Spinal: A.H.C → Flaccid
    2. Bulbar: motor cranial nerves
    3. Spino-bulbar
    4. Encephalitis
- Non paralytic polio : Picture of meningitis may followed

Precipitating factors:

- Dental & oral surgery
- Injection
- Fatigue
- Immune suppression

Diagnosis of poliomyelitis:

- Clinically: paralytic
- Lab: detection of
  1. AG in stool
  2. AB in serum

Contact control of polio:

- Passive: Ig administration during 1st week
- Active: Vaccination

Prevention:

1. General: droplet & food borne
2. Specific: it can be given from 1 day age till 5 year.

Sabin vaccine	Salk vaccine
• OPV • Used in Egypt • 3 oral doses • Given at 2,4,6 m • 2 drops on base of tongue • Booster at 18,24,School age • Advantages: - Cheap & easy - Give humoral immunity - Herd immunity • Disadvantage: - May causes disease in cases of immune suppression	• IPV • In Developed Countries • 3 IM doses • At birth,1,5 m • Formalin killed vaccine • Booster After 1 year

Diseases Controlled By Vaccination

Prevention of infectious (communicable) diseases

General

1. Health education
2. Health promotion
3. Environmental sanitation
   - Proper ventilation
   - Food sanitation
   - Waste disposal
4. Adequate ventilation

Specific

1. Chemoprophylaxis
2. Immunization
   - Passive
   - Active (Vaccination):
     - Name
     - Nature
     - Dose & Route
     - Indication
     - Contraindication
     - Side Effects

Control of infectious (communicable) disease

Control of Cases:

1. Early case finding & confirmation: Clinically & lab
2. Notification: LHO - WHO
3. Isolation:
   - Home
   - Hospital
4. Disinfection:
   - Concurrent: During illness
   - Terminal: After death or cure
5. Treatment:
   - General (symptoms)
   - Specific
6. Release: After complete clinical cure

Control of Contacts:

1. Enlistment: age - sex - incubation - vaccination status
2. Examination
3. Stop exposure
4. Segregation
5. According to vaccination:
    - Vaccinated: Just surveillance
    - Not Vaccinated
        - Early (3-4 d): Vaccination
        - Late: passive or chemo
6. Isolation: IF become infected

Control of Environment: Environmental sanitation

International Measures: Endemic area → Egypt (Y. fever, Plague & cholera):

1. Travelers:
    - Examination
    - Certificate
    - Validity: As in (0-1 day) Y. fever - (5d-6m) cholera
2. Animal:
    - Examination
    - Certificate
    - Validity
3. Vector:
    - Ship
    - Goats (Wide spread by insecticide)
    - Air croft